

22 March, 11:44:21*. Intensity VI. (cont.)

Corte Madera (811 MeadowSweet Rd.). Motion slow, wavelike.

Direction N. Loud earth noises heard. "North and south walls in living room of one apartment were severely shaken but the plaster remained undamaged, while on the opposite sides tongue-and-groove boards broke apart 1/16 to 1/8 inch at the joints. Plaster in downstairs room had new crack at girder." Damage slight. Ground: Rocky, sloping.

Corte Madera (21 Lakeside Dr.). Motion slow, then rapid, lasted about 20 seconds. Direction SE-NW. Loud earth noises heard. Small objects shifted. Very fine stucco cracks. "Man living directly across street did not feel shock. It was the most severe shock I have ever felt. Damage insignificant here. The 11:44 shock was the only one I felt." Ground: Filled in marshland.

Corte Madera (55 Chickasaw Court). Motion rapid, sharp, followed by slow waves, lasted 30 seconds. Loud earth noises heard. Small objects shifted. Very small wall plaster cracks. Damage slight. Ground: Filled in, level.

Corte Madera (171 Summit Dr.). IV. Motion very rapid. Loud earth noises heard. Direction seemed N-S. House seemed to roll several times. Ground: Rocky; on steep hillside.

Crockett. Motion rapid, lasted 1 minute. Faint earth noises heard by few. Felt by all in post office; outdoors by others (active); frightened many in community. Windows, doors, and dishes rattled; walls creaked. Trees, bushes shaken slightly. Small objects and furnishings shifted. Damage slight. Ground: Filled in, level.

Danville. Motion rapid, lasted 30 seconds. Direction W-E. Moderate earth noises from W-E heard by many. Felt by and frightened many in community. Windows and doors rattled; house creaked. Trees, bushes shaken slightly. Ground cracked. Damage none or slight to brick and concrete. Ground: Soil, compact, level.

Danville (782 Danville Highway, Route 2). V. Motion rapid, lasted 2 minutes. Direction NE. Earth noises sounded like heavy truck passing. "I was in the kitchen and saw the counters sway."

Danville (89 Turrine Circle). IV. Lasted 15-20 seconds. House creaked strongly. Ground: Wet adobe and soil, compact, level.

El Sobrante (4067 Wesley Way). Motion slow, lasted several seconds. Direction S. Hairline cracks in stucco. Damage slight. Ground: Soil, compact, sloping.

El Sobrante. V. Direction E. Moderate earth noises from NW heard by many few seconds before shock. Felt by all and frightened few in community. Hanging objects swung E. Ground: Compact.

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El Sobrante (4563 Utah Dr.). IV. Motion rapid. Faint earth noises heard. Bird cage rocked. Ground: Soil, sloping.
Fairfax. Motion rapid, lasted 6 seconds. Moderate earth noises heard by few. Felt by all in post office, by others outdoors; awakened few and frightened many in community. Windows, doors rattled; building creaked. Hanging objects swung. Small objects and furnishings shifted; vases and small objects overturned. Plaster cracked. Knickknacks fell. Damage slight. Ground: Rocky, level.
Fairfax (Cascade). IV. Motion rapid, lasted about 15 seconds. Direction E-W. Loud earth noises sounded like a big cement truck coming down the hill. Ground: Rocky soil, compact, sloping.
Fairfax (485 Scenic Rd.). IV. Motion moderate. Felt like house was hit at SE corner. Direction NE. Ground: Rocky, sloping; hillside.
Fairfax (100 San Gabriel Dr.). IV. Motion rapid, lasted 3-4 minutes. Moderate earth noises heard. Few small objects rattled. Ground: Rocky, sloping.
Fairfax (31 Gregory Dr.). III. Motion rapid, lasted 30 seconds. Direction NE. Moderate earth noises heard. Ground: Compact, level.
Fairfax (22 Fir Path). II. Motion rapid, lasted 3 seconds. Ground: Loose, sloping.
Tremont. Motion rapid, lasted 45 seconds. Direction NE. Faint earth noises from NE heard. Felt by many (some outdoors; active) and frightened many in community. Windows, doors, and dishes rattled; house creaked. Small objects shifted; vases, etc., overturned. Plaster cracked. Knickknacks and pictures fell. Ground: Soil, compact.
Glen Ellen. Motion rapid, lasted 30 seconds. Direction NE. Faint earth noises from NE heard by few. Felt by all in community; frightened many. Windows, doors, and dishes rattled; house creaked. Hanging objects swung NE. Pendulum clocks stopped. Trees, bushes shaken moderately. Damage slight. Ground: Rocky, level, sloping.
Gulf of the Farallones. Lightship on the bar, about 9 miles offshore of San Francisco, reported "heavy shock and violent flapping of anchor chains."
Half Moon Bay. Motion slow, lasted 10 seconds. Direction E. Felt by and frightened all in community. Hanging objects swung E-W. Trees, bushes shaken strongly. Small objects shifted and overturned. Plaster and walls cracked. Knickknacks, books, and plaster fell. Damage slight. Ground: Soil, compact, level.
Half Moon Bay. Press reported fuse was shaken loose in substation, causing temporary power failure.

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Hillsborough. Press reported Hillsborough apparently had no damage except for a small water line which broke in front of 640 Marlborough Road.

Hillsborough (551 Craig Rd., Carolands). Motion rapid, lasted 2 seconds. Moderate earth noises heard. Small objects shifted. Plaster and walls cracked. Damage slight. Ground: Soil, compact, level and sloping.

Hillsborough (986 Baileyana Rd.). Motion rapid, lasted 5 minutes. Loud earth noises heard. Plaster and ground cracked. Damage slight. Ground: Soil, compact, level.

Hillsborough (960 Black Mountain Rd.). Motion slow, lasted 5-10 seconds. Direction N. Loud earth noises heard. Some retaining walls cracked. Small objects and furnishings shifted. Ground: Clay, some shale; hillside.

Hillsborough (550 Pullman Rd.). V. Motion rapid, lasted about 1½ minutes. Direction NNE. Loud earth noises heard. Small objects shifted. Ground: Rocky.

Hillsborough (1763 Forest View Rd.). V. Motion slow, lasted 5-6 seconds. Direction N-S. Small objects shifted. Ground: Compact, level.

Hillsborough (70 Downey Way). V. Motion slow, lasted 30-40 seconds. Moderate earth noises heard. Small objects shifted. Brick and masonry planter outdoors slightly damaged. Ground: Soil, loose, sloping.

Hillsborough (about 1½ miles east of Crystal Springs Lake, 815 Hillsborough Blvd.). V. Motion rapid, rolling, lasted about 8 seconds. House rolled. Two objects fell toward S. "Very minor dish breakage. Three doors on N-S axis seem to stick less than usual." Ground: Soil, compact, level.

Hillsborough (550 Ramillard Dr.). III. Motion rapid, lasted few seconds. Direction W-E. Ground: Rocky soil.

Hillsborough. III. Motion slow. Direction N. Faint earth noises heard. Ground: Rocky, compact, sloping.

Kentfield. Motion rapid, lasted 1 minute. Direction NW. Loud earth noises heard. Plaster cracked. Damage slight. Ground: Soil, sloping.

Kentfield. V. Motion rapid, lasted 1 minute. Moderate to loud earth noises heard by many. Felt by and frightened all. "Noise was frightening. I had never heard that before." Ground: Level.

Kentfield. V. Motion trembling, abrupt onset. Earth noises heard by several. Visible swaying of buildings and trees. Observer reported slight damage to buildings (type and extent unknown). Ground: Clay.

Kentfield (837 Sir Francis Drake). V. Motion rapid, lasted about 10 seconds. Direction N. Moderate earth noises heard. Trunks shifted. Ground: Rocky.

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Kentfield (111 Diablo Dr.). V. Motion rapid, lasted about 15 seconds. Moderate earth noises heard. Small objects shifted. Ground: Rocky soil, compact, steep.

Kentfield. IV. Motion rapid, lasted 10 seconds. Direction E. Felt by observer on first floor of strongly built wood-brick building (sitting); frightened few in community. Loud earth noises from W heard by many. Windows rattled; walls creaked. Ground: Marshy.

Marin City. Motion rapid, lasted 30 seconds. Loud earth noises heard. Felt by all and frightened many in community. Windows, doors, and dishes rattled; house creaked. Furnishings shifted. Ground: Level, loose, filled in.

Menlo Park (on San Francisquito Creek, just across from the Stanford Campus, 1925 Oak Ave.). "Heard low-pitched earth noise for at least 2 seconds before I felt any motion. Then the house vibrated at such a rapid rate I first thought that something had broken in one of the appliance motors around the house and that the vibration was caused by a motor running with unbalanced shaft. Frying pan on the burner of a built-in electric range (mounted on a wall about 4 feet above a concrete foundation) made a terrific noise and seemed to jump up and down, but chairs and tables supported by a more springy wooden floor did not. I concluded from this that the vertical component of acceleration came very close to 'g.' The frequency was not far from the pitch of the lowest note on a piano, and I would say that a vertical motion of perhaps 15-20 cycles/sec and amplitude of nearly a half-millimeter would account quite well for what was noticed in the house. The duration seemed about 30 seconds; however, I imagine it was really closer to 5 seconds. As soon as I realized it was an earthquake, I decided to watch the water in a swimming pool just outside the house. By this time the vibrations had slowed down somewhat, and the surface of the water was covered with small waves (wave length perhaps 4 inches) moving in a N-S direction; so it seems that the initial motion also had a N-S component. There was a period of a few seconds of comparative quiet, then a very much slower E-W motion started, which set up waves on the pool with a wave length of perhaps 4 feet and an amplitude of nearly 3 inches, almost splashing the water over the coping. The pool is 36 feet long in the E-W direction. Motion of the water in the pool could still be seen 20 minutes later."

Menlo Park (1325 Crane St.). Motion began gradual, then increased in intensity, lasted about 4 minutes. Direction NE. Loud earth noises heard. Plaster cracked. Ground: Soil, level.

Menlo Park (302 Leland Ave.). V. Motion rapid, rolling, strong for 35 seconds. Direction N and W-E. Moderate roaring earth noises heard. Glassware and door chimes shifted. Ground: Underground river 20 feet below surface.

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Menlo Park (1075 Sherman Ave.). V. Motion moderately rapid, lasted 3 minutes. Direction easterly. House rocked. Water in aquarium moved. Ground: Level, filled in.

Menlo Park (620 Olive St.). V. Motion rapid, lasted about 5 minutes. Direction NW. Moderate earth noises heard. House creaked. Small objects shifted. Long brass tubes (part of doorbell chimes) swung in NW-SE direction for 5 minutes after shock. Five-gallon water container (full) swayed violently NW-SE. Ground: Soil, level.

Menlo Park (308 Hedge Rd.). V. Motion slow, lasted 8-10 seconds. Direction NW-SE. Moderate earth noises heard. Small objects shifted. Ground: Soil, compact, level.

Menlo Park (760 Hobart St.). V. Motion rapid, lasted 2 minutes. Direction N-S. Moderate earth noises heard. Small objects and furnishings shifted. Ground: Soil, level, filled in.

Menlo Park. Locations reporting no shifted or fallen objects and no damage:

837 Partridge Ave.

1045 Noel Dr.

102 Britton Ave., Maurice Beauty Salon

723 Fremont St.

281 Stanford Ave.

No. 2 Coleman Place

19 Bishop Lane. "I felt only the one shock at 11:44."

1038 Marcussen

971 Alice Lane

Menlo Park (west of, Portola Valley, 34 Grove Dr.). "Most of my neighbors felt the shock. I did not feel it due to noise and vibration made by radio, children, and household equipment."

Millbrae. Press reported the City Hall and a Safeway market at Hillcrest Boulevard were severely damaged. Front of the City Hall was badly cracked; window broke in water department. Firemen reported one chimney cracked at 543 Bayview Avenue and several water heaters were broken. Undetermined number of plate glass windows broke and glass strewn out on sidewalks along El Camino Real and Broadway. Plaster may have fallen from ceilings in a number of buildings. Six injuries were reported.

Millbrae Schools:

Capuchino High School. Glass fell.

Greenhills School. Sash fell.

Taylor Boulevard School. Heavy acoustical tile fell from ceiling.

Millbrae. Motion rapid, lasted 15 seconds. Loud earth noises heard 2 seconds before shock. Felt by and frightened all in community. Windows, doors, and dishes rattled; house creaked. Hanging objects swung N-S. Small objects and

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furnishings shifted; vases, etc., small objects and furniture overturned. Plaster cracked. Knickknacks, books, and pictures fell. Dishes broke. Damage moderate. "While the shock was severe, damage in this community was moderate and mainly limited to loose items being shaken to the floor or ground." Ground: Compact, level.

Millbrae (311 Juanita Ave.). Two distinct types of motion. Loud earth noises heard. Small objects and furnishings shifted. Dishes broke. Chimneys twisted. Damage slight. Ground: Sloping.

Millbrae (1304 Vista Grande). Motion slow, lasted 4-5 seconds. Loud earth noises heard. Plaster and walls cracked. Damage slight. Ground: Compact, level, filled in.

Millbrae. Motion rapid, lasted 30 seconds. Direction W-E. Loud earth noises heard. Small objects and furnishings shifted. Dishes broke. Retaining wall cracked. Damage slight to concrete. Ground: Sloping.

Millbrae (311 Poplar Ave.). Motion slow, lasted about 1 minute. Direction N. Loud earth noises heard. Small objects and furnishings shifted. Dishes broke. "Our house is 1½-story Mediterranean style built on compact, sloping ground. A deep rumbling noise was heard. The house seemed to rise up as if on the crest of a wave, tilted precariously to the north, shuddered violently, then jolted down into place, then quivered and rattled for what seemed to me a full minute. Plaster between 6-inch brick in the patio cracked. Brick chimney on side of house was dislodged about $\frac{1}{4}$ inch. In all, minor damage. At intervals during the afternoon a swaying motion was felt, with an occasional violent shake."

Millbrae (Broadway Market, El Camino Real). Motion slow, lasted 20-30 seconds. Direction N-S. Small objects and furnishings shifted. Dishes broke. Plaster cracked. Damage slight. Ground: Soil, compact, level.

Millbrae (679 Santa Barbara). Motion rapid, rolling, lasted about 1 minute. Moderate earth noises heard. Furnishings shifted about 6 inches from walls. Dishes and one window broke. Very slight ground cracks. Damage slight. Ground: Soil and clay, compact, sloping.

Millbrae. Motion rapid, lasted about 1 minute. Direction N-S. Loud earth noises heard. Small objects and furnishings shifted. Walls and ground cracked. Damage to concrete (extent unknown). Ground: Marshy, filled in.

Millbrae (1380 Vista Grande, near Skyline Blvd.). Motion slow, but definite. Direction indoors E-W. Loud earth noises heard. Small objects shifted. Chimneys cracked slightly. Ground cracked. Damage slight to brick, masonry, and concrete. Ground: Rocky soil, sloping.

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Millbrae (607 Cypress Ave., 1 block from Capuchino High School).

Motion rapid, severe shaking up and down and sidewise, lasted 4-5 minutes. "From direction taken by fallen objects would say motion was N-S." After first loud thud, moderate earth noises heard. Refrigerator and stove shifted slightly. Fine plaster cracks and dust. Damage slight. Ground: Soil, compact, sloping.

Millbrae (62 Spruce St.). Motion rapid, lasted 1-2 minutes. Loud earth noises heard. Very slight plaster cracks. Ground: Loose, level, filled in.

INTENSITY V - Millbrae

Millbrae (18 Corte Princesa). Lamps and bric-a-brac fell. Ground: Soil, compact, sloping.

Millbrae (1379 Vista Grande). Small objects shifted. Ground: Soil, compact, sloping.

Millbrae (140 Alta Loma). Small objects and furnishings shifted. Ground: Soil, compact, sloping.

Millbrae (1399 Vista Grande). Small objects and furnishings shifted. Dishes broke. Damage slight. Ground: Hard clay, sloping and steep (canyon bank).

Millbrae (33 El Bonito). Shifted small objects. Dishes broke. Ground: Compact, sloping.

Millbrae (244 Helen Dr.). Small objects and furnishings shifted. Small plaster cracks opened. Damage slight. Ground: Soil.

Millbrae (865 Brookdale Lane). Small objects shifted. Damage slight. Ground: Compact, level.

Millbrae (1119 Hillcrest Blvd.). Small objects shifted. Ground: Soil, compact, sloping.

Millbrae (1332 Vista Grande). Small objects shifted. Dishes broke. Damage slight. Ground: Soil, compact, level and sloping.

Millbrae (395 Ashton Ave.). Small objects and furnishings shifted. Dishes broke. Damage slight. Ground: Rocky, sloping.

Millbrae (608 Geraldine Dr.). Small objects and bed shifted. Figurines and jars broke. Existing cracks lengthened. Ground: Soil, loose.

Millbrae (1336 Ridgewood Dr.). Small objects shifted. Dishes broke. Damage slight. Ground: Rocky.

Millbrae (1107 Hillcrest). Small objects fell. Ground: Rocky, sloping.

Millbrae (143 Park Blvd., north Millbrae). Small objects shifted and table (on rollers) rolled east. Ground: Soil, compact, level.

Mill Valley (107 Walnut Ave.). "Shaking preceded by rumbling sound, as though a huge truck were passing by, then in accompaniment with the noise, which grew louder and louder, things started to vibrate, slowly at first, then harder,

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until I felt thoroughly shaken. It all diminished with a slower motion. I was not conscious of any direction. My son was outdoors and said the house 'wiggled awful.' House is on firm, level ground, very compact, even though situated right next to a creek. Rumbling seemed to come up from the ground. In some rooms nothing moved; in others, almost everything moved. For the most part, objects along outside walls didn't move at all, while objects on the inside walls did. Plaster cracked on inside walls only. One crack had a corresponding crack in the next room but did not actually go all the way through the wall. Felt no twisting sensation at all. No chimneys or uprights fell. Foundations, walls, etc., are in good shape. The only damage was to plaster and small objects which fell."

Mill Valley (59 Lomita Dr.). Motion rapid, lasted 10 seconds. Faint earth noises heard. Damage considerable to concrete foundations and retaining walls. Ground: Rocky soil, sloping.

Mill Valley (900 feet up on the ridge above Muir Woods). Motion rapid. Direction S-N. Loud earth noises heard. Small objects and furnishings shifted. Plaster cracked. Damage slight. Cupboard moved $\frac{1}{2}$ inch from wall. Pictures on walls shifted. Two cracks in sheet rock wall of stairway. Ground: Rocky, sloping, steep.

INTENSITY V - Mill Valley

Mill Valley. Motion rapid, lasted 10 seconds. Felt by all on first floor of strongly built cement building (sitting), by others outdoors (active); frightened many in community. Windows rattled. Ground: Rocky soil, level.

Mill Valley (Tamalpais Valley, 376 Sunset Way). Small objects and furnishings shifted slightly. Closed a crack between outside wall and chimney. Ground: Soil, compact, sloping.

Mill Valley (27 W. Blithedale). Small objects and furnishings shifted slightly. Ground: Compact.

Mill Valley (200 Sycamore). Small objects shifted. Ground: Level, compact.

Mill Valley (403 Spruce St.). Small objects shifted. Ground: Level, filled in.

Mill Valley (206 W. Blithedale). Old minor crack opened. Ground: Soil, compact, level.

Mill Valley (208 Corte Madera). Small objects shifted. Ground: Soil, compact.

Mill Valley (146 Blackfield Dr.). Small objects and T.V. shifted; mirror fell off wall. Ground: Soil, compact, level.

Mill Valley (Tamalpais High School). Windows broke. Damage slight. Ground: Compact, sloping.

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INTENSITY V - Mill Valley

Mill Valley (65 W. Blithedale Ave., bottom of Blithedale Ave.).

Two or three slight plaster cracks. Ground: Bottom of canyon; 30 inches topsoil over 9 feet gravel and conglomerate, then hard, blue bedrock.

Mill Valley (422 Marion Ave.). Small objects shifted. Ground: Soil, compact, sloping.

Mill Valley (52 Bigelow Ave.). Small objects and furnishings shifted slightly. Ground: Rocky, hardpan.

Mill Valley (200 Eldridge). Small objects shifted very slightly. Ground: Rocky, compact, steep.

Mill Valley (at school). Books in desk shifted slightly. Ground: Level, marshy, filled in.

Mill Valley. Locations reporting no shifted or fallen objects and no damage:

740 Summit Ave.

24 Lorelei Lane

135 Belvedere Dr. (Strawberry Point)

33 Homestead Blvd.

452 Throckmorton

22 Apollo Rd.

501 Midvale Way

15 Altamont

24 Parkwood Ave.

286 Marion Ave.

528 Marin Ave.

Safeway Market

357 Karen Way

239 Leed Blvd.

Mill Valley (south edge of Richardson's Bay). Motion rapid, lasted less than 1 minute. Direction N-S. Felt by all on second floor of strongly built wooden house (sitting); frightened few in community. Windows, doors, and dishes rattled; house creaked. Hanging objects swung. "I did not feel any previous shocks nor any aftershocks. Movement increased slowly in rapidity and intensity. Thought it was a train going by at first." Ground: Rocky, sloping and steep.

Napa. Motion rapid, lasted 5 seconds. Loud earth noises heard by many. Felt by all in post office; outdoors by others (active); awakened and frightened few in community. Windows, doors, and dishes rattled; building creaked. Hanging objects swung. Plaster cracked. Damage slight. Ground: Soil, level.

Napa (2031 Pine St.). One rapid movement, then slow trembling, lasted 5-8 minutes. Direction N-S. Faint earth noises heard.

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Small objects and furnishings shifted. Plaster cracked.
Damage slight. Ground: Compact, level.

INTENSITY V - Napa

Napa (16 Geraldine Court). Small objects shifted. Ground: Soil, compact, level.

Napa (317 Coombs St.). Chandelier swung like a pendulum. Floor swayed "like ocean waves." Ground: Adobe, level.

Napa (741 Ornduff St.). Small objects and furnishings shifted. Car in carport rolled up and back. Ground: Soil, compact, level.

Napa (1121 Brown St.). Small objects and furnishings shifted. Ground: Soil, level.

Napa (102 Casswell St.). Small objects and furnishings shifted. Ground: Rocky soil, level.

Napa (1938 First St.). Small objects and furnishings shifted. Ground: Soil, level.

Napa (3 miles east of, 3051 Vichy Ave.). Small objects and furnishings shifted. Ground: Soil, compact, level.

Napa (605 Patchett St.). Small objects and furnishings shifted. Ground: Compact.

Napa (2601 Wimbledon). Small objects shifted. Slight crack in wood molding over front door. Ground: Soil, level.

Napa (SW section, Sheveland Ranch). III. Motion rapid, E-W, lasted 30 seconds. Faint earth noises heard. Ground: Soil, compact.

Napa (1373 El Capitan Way). III. Motion slow, lasted $1\frac{1}{2}$ minutes. Direction N-S. Ground: Soil.

Niles. Motion slow, momentary duration. Faint earth noises heard. Felt by all and frightened many in community. Windows, doors, and dishes rattled; house creaked. Trees, bushes shaken slightly. Small objects shifted. Ground: Soil, compact, level.

Novato. Motion rapid, lasted 20 seconds. Moderate earth noises heard by many 5 seconds before shock. Felt by many (some outdoors; active) and frightened many in community. Windows, doors, and dishes rattled; house creaked. Hanging objects swung. Small objects shifted and overturned. Walls cracked. Knickknacks and pictures fell. Dishes broke. Damage slight to brick and masonry. Ground: Soil, level.

Novato (750 Kendon Lane). V. Motion rapid, lasted 3-4 seconds. Loud earth noises heard. "The ground under our house undulated violently in a strong W-E motion. The roof sounded like it was being torn completely off. Small objects seemed to bounce. The shade on a large lamp was displaced but the lamp did not fall. I was looking at a huge picture

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that hangs on the inside wall of the living room. It swung out from the wall from the bottom to a distance of about 6 inches but did not tilt at any angle when it stopped moving. All other pictures and mirrors in the house were tilted. The noise was astonishingly loud and sounded like a swiftly moving train had suddenly run under the house. Noise was unlike any sound I have ever heard. As far as we can determine, there was no damage, not even any new cracks. Our house is made of concrete blocks, 8 inches thick, reinforced with steel rods, and built off the ground about 3 feet. One other interesting fact which I noticed was that three large dishes, which I keep on top of a fence for the birds drinking water, were not disturbed in any way, but only the day before, all three were knocked to the ground by the sonic boom that was felt and heard here in Novato." Ground: Soil, compact, level.

Novato (Marion School). V. Motion slow, lasted about 3 seconds. Faint to moderate earth noises heard. Jarred pencils and rulers off desks. Ground: Compact, level.

Novato (1547 Center Rd.). V. Motion rapid, lasted 30 seconds. Direction E. Loud earth noises heard. Small objects shifted. "We were sitting in the living room. The house seemed to fall straight down with a heavy jolt. Dishes shifted around but none broke." Ground: Rocky soil.

Novato (2 miles west of, 715 Eucalyptus). III. Motion slow, then a jolt, lasted 30 seconds or less. Direction E-W. Moderate to loud earth noises heard. Ground: Soil.

Novato (1028-6th St.). II. Motion rapid, lasted 30 seconds. Faint earth noises heard. Ground: Soil, compact, level.

Novato (1680 Indian Valley Rd.). II. Motion slow, lasted about 1 minute. Faint earth noises heard. Ground: Rocky, compact, steep.

Oakland. Press reported Oakland's tallest building, the telephone structure at 15th and Franklin Sts., swayed like a tree. Hundreds of persons at the Leamington Hotel sought safety beneath doorways, or rushed headlong into the streets. Large cracks appeared in the outside walls of the Oakland Veterans Administration Hospital. Almost every grocery store and supermarket throughout the two counties (Alameda and Contra Costa) reported masses of toppled canned goods. Two giant skylight windowpanes in the Highland Hospital surgery broke, and upper-story windows of the Town House, 20th and Broadway, broke.

Oakland (City Hall). Minor plaster cracking.

Oakland Schools. "All Oakland schools, except those consisting entirely of portable buildings, were inspected. Only very minor cracking seemed to have occurred in State approved schools. In a few cases, extensive cracking occurred in a few unapproved school structures such as Emerson,

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Hoover Jr. High, Oakland Junior College (Merritt), Santa Fe, and Wilson (Academic Building). In many cases it was questionable whether the cracks were due to settlement or shrinkage or whether they were caused by the earthquake."

Chabot. Academic Building. Cracks in wood ceiling beams. Plaster cracks in Art Room hall.

Clawson. Small break under sun deck at NW corner of building. Plaster crack in Room 30 at window. Plaster crack at transom at west end of upper corridor.

Cleveland. Horizontal crack on outside of building near Auditorium entrance.

Crocker Highlands. Old 2-story building. Cracks around skylights in second story corridors.

Durant. Room 24: Old plaster crack opened up. Room 15: Crack across back of room and plaster crack on wall opposite entrance to room.

Emerson. Cornice cracked in foyer. Plaster badly cracked in teachers' rest room and lunch room. Teachers' toilet (east side of building): Plaster fell, some loose.

Traffic patrol room: Plaster loose. Tile on gable end (rear of building) had appearance of being loose. Tile at southwest corner appeared broken. On rear of building wall was cracked over windows of Room 14 and boys' and girls' toilets.

Fruitvale. Many plaster cracks which appear to be shrinkage cracks.

Golden Gate. Loose plaster in Room 120.

Grant. Room 1 (NW corner): Crack in plaster. Room 7 (SW corner): Plaster crack from ceiling to floor, also shows on stairwell side. Southwest corner on exterior: Half-timber is loose. Room 5 (NE corner): Crack from ceiling to floor. Kindergarten Terrace (S side): Horizontal crack below floor.

Hillcrest. Plaster soffit on west side of Kindergarten - piece fell off. Cracks in corridor near Rooms 2 and 3.

Hoover Jr. High. Old break in wall between Shop and Girls' Gymnasium seemed to have opened up. Plaster cracks in Rooms 34 and 36.

Jefferson. Annex: Cracks reopened in northeast corner.

Lafayette. Plaster crack at ceiling beam between lobby and corridor. Cracks at corridor entrances to stage and cafeteria.

Lakeview. Loose plaster in Room 16. Plaster cracks in stairway at west end. Rooms 1, 3, 4: Plaster cracks showed signs of opening up.

Laurel. Classroom and Auditorium Building: Roof tile on north of Auditorium looked loose where it projects beyond gutter.

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Oakland Schools (cont.)

Maxwell Park. Run plaster molding over main entrance loosened.

McChesney. Crack on exterior through two stories at junction of Auditorium and north wing (cause of this crack doubtful since there were no fragments of stucco on ground).

McClymonds. Plaster crack in wall and tile wainscot near custodian's room near staff dining room. Plaster crack in corridor near Rooms 210, 211, 212.

Oakland Junior College (Merritt). Academic Building: Bulging plaster on ceiling in Room 49. Bulging plaster in men's toilet in rear of corridor. Pieces of cast cement on terrace floor at entrance to Auditorium (may have dropped from columns and pilasters).

Peralta. Some plaster appeared loosened in ceiling of Auditorium.

Santa Fe. Main Academic Building: Loose brick in entrance arch to Auditorium. Crack in arcade near street entrance. Classroom Annex: Crack in one of the arcade arches.

Washington. Crack in concrete wall west of main entrance.

Wilson. Academic Building: Crack in southwest corner of dining room. Cast stone capitals over main entrance showed a very wide joint at base. Crack in concrete wall at west stage entrance. Room 13: Crack in plaster. Library: Crack in plaster. Second floor corridor: Plaster cracks in southwest corner. Girls' toilet (second floor): Plaster cracks. Stair Hall (northeast corner): Horizontal crack above landing. Same stair - crack at head of stair on left side. Room 10 (northeast corner): Bulge in plaster. Girls' gymnasium (southwest corner): Crack in concrete wall, also cracks in south wall. Room 54: Bulges in plaster ceiling.

No leaks reported in gas lines at any school.

Oakland. Motion rapid, lasted 1 minute. Felt by all at work in Bayshore Annex post office; frightened many in community. Windows and doors rattled. Hanging objects swung. Plaster cracked. Damage slight. Ground: Level, marshy, filled in.

Oakland (490 Lake Park Ave.). Motion rapid. Direction N. "I was having lunch in car at time of shock. Car (parked E-W) rocked with vigorous sidewise motion. Felt by all at post office; frightened few. Trees, bushes shaken moderately.

Plaster cracked. Damage slight. Ground: Level, filled in. Oakland (Fruitvale Post Office Station). Motion rapid, lasted 2 minutes. Direction E. Moderate earth noises from E heard by many. Felt by all; frightened few. Windows and doors rattled; walls creaked. Hanging objects swung.

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Trees, bushes shaken strongly. Small objects and furnishings shifted. Broke mail from cases. Ground: Compact.
Oakland (4255 St. Andrews Rd.). Motion rapid, lasted 40-45 seconds. Direction E-W. Moderate earth noises heard. Small objects and furnishings shifted. Concrete walls cracked. Ground: Rocky.
Oakland (3520 Brighton Ave.). Motion rapid, lasted 15-20 seconds. Small objects shifted. Plaster, windows, and walls cracked. Damage slight.
Oakland (4041 Oakmore Rd.). Motion rapid, lasted about 10 seconds. Moderate earth noises heard. Plaster cracked. Damage slight. Ground: Soil, compact, sloping.
Oakland (1025-2nd Ave.). Motion slow, lasted about 30 seconds. Moderate earth noises heard. Furnishings shifted. Plaster cracked. Damage slight. Ground: Level, filled in.
Oakland (East Oakland, 5717 Foothill Blvd.). Motion rapid, lasted about 1 minute. Moderate earth noises heard. No objects moved in store. Plaster and walls cracked. Damage slight. Ground: Level.
Oakland (6214 Acacia). Motion rapid, lasted 30 seconds. Moderate earth noises heard. Small objects and furnishings shifted. Few plaster cracks. Ground: Rocky, sloping.
Oakland (Highland Hospital). Motion moderate, lasted about 1 minute. Small objects shifted. Plaster and windows cracked. Damage slight. Ground: Soil, sloping.
Oakland (East Oakland, 1019 E. 52nd Ave.). Light fixture swung violently. Iron tie rods in hollow brick building snapped and knocked against each other noisily for some time after shock. Two men, feeling the building was threatened, ran from this building and the adjoining shop. Ground: Level.

INTENSITY V - Oakland

Oakland (Hotel Leamington). Chandeliers swung 1 foot. Ground: Level.
Oakland (3544 Fruitvale Ave.). Motion rapid, two shocks, lasted 30 seconds. Direction S-N. Felt by all in post office, by others outdoors (active); frightened few in community. Windows, doors, rattled strongly; entire building creaked. Hanging objects swung. Ground: Soil, level, compact.
Oakland (Temescal Post Office, 48th and Telegraph Ave.). Motion rapid, lasted 30 seconds. Direction N. Moderate earth noises from N heard by many. Felt by all in station; by others outdoors (active); frightened few. Doors rattled; walls creaked. Hanging objects swung N.
Oakland (Elmhurst Post Office Station). Motion rapid, lasted 30 seconds. Moderate earth noises heard by few before shock. Felt by and frightened all in building. Ground: Compact, level.

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INTENSITY V - Oakland

Oakland (West Oakland Post Office Station). Motion rapid, lasted 10 seconds. Felt by several in station; frightened many in community. Windows and doors rattled; walls creaked. Hanging objects swung E-W. Ground: Soil, level.

Oakland (Rockridge Post Office Station). Motion rapid, lasted 3 seconds. Moderate earth noises heard by many. Felt by all; frightened few in community. Windows rattled. Ground: Compact, level.

Oakland (Mills College Post Office Station). Motion slow, lasted 20 seconds. Felt by all. Windows and doors rattled; building creaked.

Oakland (Post Office Building). Motion slow. Felt by and frightened all in strongly built building. Ground: Soil, compact, level.

Oakland. Motion rapid, lasted 30 seconds. Felt by all in community. Loud earth noises heard by many. Windows and doors rattled; building creaked.

Oakland (374-17th St.). Motion swaying E-W, then abrupt N-S, rapid onset, seemed to last about 15 seconds. Felt by all. Slight rattling of loose objects and creaking of building heard by all. Light fixtures swung. Ground: Sandy silt.

Oakland (PG&E Garage, Washington and Water Sts.). Small objects and furnishings shifted. Five-foot vertical antenna on PG&E service truck whipped almost due E-W. Ground: Compact, level.

Oakland (5915 Ross St., near Broadway Tunnel Rd.). Caused doors to sag. Ground: Compact, level.

Oakland (2729 Alvingroom Court). Lamps knocked off end tables on third floor. Ground: Loose, sloping.

Oakland (420 Broadway). Slight loosening of metal strips between acoustical tile on ceiling. Ground: Soil, level.

Oakland (1519 Alice St.). Disconnected oven stovepipe in kitchen from wall. Felt like building swayed 3-4 inches. Ground: Compact, level, filled in.

Oakland (Montclair business district). Doors banged. Ground: Soil, sloping.

Oakland (First Western Bank Bldg.). Suspended lights swung freely on 13th floor. Clocks stopped.

Oakland. Locations reporting shifting or movement of small objects:

119-7th St.

265-91st Ave.

Bay Area Army Terminal, Warehouse ?

1138-90th Ave.

3022 East 14th St., Fruitvale Medical Building

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INTENSITY V - Oakland

705 East 15th St.
903-84th St.
6309 Outlook Ave.
Naval Air Station
364-14th St.
4101 Maple Ave.
Near 35th Ave. and MacArthur Blvd., East Oakland
9447 D St.
66th Ave. and East 14th St.
506-16th Ave.
1801-108th Ave.
1143 East 14th St.
93 Vernon St.
850 Sunnyhills Rd.
5118 Clarke St.

INTENSITY IV - Oakland

Oakland (Eastmont Post Office Station, 6948 Foothill Blvd.). Motion slow, lasted 5 seconds. Moderate earth noises heard. Felt by several in station (active). Windows and doors rattled; walls creaked. Ground: Sloping.

Oakland (Naval Hospital Post Office Station). Motion rapid, lasted 30 seconds. Faint earth noises heard. Felt by observer on second floor of strongly built wooden building. Windows and doors rattled.

Oakland (2228-42nd Ave.). Motion slow. Loud earth noises heard. Felt by and frightened three in home. Windows rattled; walls creaked.

Oakland (Chabot Observatory). Motion rapid, rolling, circular, lasted 4-5 seconds. "Quite noisy." Frightened few in home. Windows, doors, and dishes rattled; building creaked. Trees, bushes shaken moderately. Ground: Rocky; on hill.

Oakland. Locations reporting no shifted or fallen objects:

1420 Franklin St.
616 Apgar St.
69th Ave. and Foothill Blvd.
2028 Foothill Blvd.
Near Lake Merritt on Lakeshore Highlands
17th and Peralta (West Oakland)
Lakeshore Ave.
578 Grand Ave.
Lake Merritt Boat House
Kahn's Store, 17th and Telegraph Ave.
607 Beacon St.

22 March, 11:44:21*. Intensity VI. (cont.)

INTENSITY IV - Oakland

660 Beacon St.
3516 Harrison St.
Naval Supply Center
1625 Clay St., PG&E System Dispatcher's Office

Palo Alto (195 Walter Hays). Motion rapid, lasted about 1 minute. Direction NE. Moderate earth noises heard. Bath tub shifted slightly. Plaster, walls, and ceiling cracked. Damage slight. Ground: Soil, compact, level.

Palo Alto (near Bayshore Highway). Building moved up and down then swayed. Lasted 1-2 minutes. Faint earth noises heard. Doorway cracked. Damage slight. Ground: Compact, level.

Palo Alto (878 Clara Dr.). Motion rapid, lasted several seconds. Loud roaring earth noises heard. Eaves and drainpipe pulled loose on one side of house. Caused toilet to flush. Ground: Adobe, level.

Palo Alto (Palo Alto Senior High School). Motion fairly rapid, lasted 30 seconds. Direction E-W. Faint earth noises heard. Roof (probably ceiling) of Classroom 45 cracked.

INTENSITY V - Palo Alto

Palo Alto (Veterans Hospital Branch Post Office). Direction E. Felt by all (quiet) in strongly built concrete building; by others outdoors (quiet); awakened few; frightened many in community. Building creaked. Hanging objects swung. Ground: Soil.

Palo Alto (2245 Webster St.). Chandelier swung from side to side then in complete circles. Heavy shock. Ground: Compact, level.

Palo Alto. Locations reporting shifting of small objects:

1525 Walnut Dr.
3918 Duncan Pl.
1107 Galvez Dr.
1135 Fulton St.
3718 Redwood Circle
Stanford University
60 Alannah Court
2420 Illinois St. (SE section)
575 Embarcadero Rd.

INTENSITY IV - Palo Alto

Palo Alto. Motion rapid and slow, lasted 30 seconds. Felt by many (sitting) on first floor of strongly built concrete

22 March, 11:44:21*. Intensity VI. (cont.)

INTENSITY IV - Palo Alto

building; by others outdoors; frightened few. Hanging objects swung. Ground: Soil, level.

Palo Alto. Locations reporting no shifted or fallen objects:
4045 Laguna Way (south Palo Alto)
1187 Lincoln Ave.
3359 St. Michael Court
241 Creekside Dr.
526 Lowell Ave.
2521 Louis Rd.
1503 Escobite
523 Webster
228 Seale Ave.
15 Roosevelt
769 Garland Dr.
South Palo Alto
846 Lytton Ave.
3209 Morris Dr.
533 Cowper
318 Hawthorne Ave.
1405 Edgewood
2325 Santa Ana

Pedro Valley (Linda Mar). Press reported a Pacific Manor supermarket was damaged so badly it was closed.

Pedro Valley (Linda Mar). Six-inch pipe separation at the sewage plant. It was reported that this was due to settlement and that it seemed likely much of the settlement took place prior to the earthquake.

Pedro Valley. Heavy shock. Loud earth noises heard. Lasted 30 seconds. Frightened many in community. Windows, doors, and dishes rattled; house creaked. Hanging objects swung. Dishes and articles on shelves fell at liquor and hardware stores. Damage slight. Ground: Soil, level, marshy.

Pedro Valley (816 Crepsi Dr., Linda Mar). Motion rapid, lasted 3-4 minutes. Moderate earth noises heard. Small objects and furnishings shifted. Dishes broke. Cement porch and driveway cracked. Damage slight to concrete.

Pedro Valley (803 Crepsi Dr.). Motion moderately rapid, rocking, lasted 3 minutes. Moderate earth noises heard. Small objects shifted. Ground cracked. Water heater broke. Ground: Rocky, sloping.

Pedro Valley (Linda Mar). Motion rapid, lasted 20 seconds. Direction NE. Moderate earth noises heard. Small objects and furnishings shifted. Plaster, walls, and ground cracked. Damage slight. Ground: Loose, level, sloping.

22 March, 11:44:21*. Intensity VI. (cont.)

Pedro Valley (1028 Monte Verde Dr.). Motion rapid, lasted 30 seconds. Direction NE. Loud earth noises heard. Small objects shifted. Hairline cracks in stucco. Damage slight. Ground: Soil, compact, sloping.

Pedro Valley (675 Malaga Dr.). Motion rapid, lasted 15 seconds. Direction E-W. Loud earth noises heard. Small objects and books shifted. Driveway cracked. Ground: Soil, compact, level.

Pedro Valley (839 Arguello Blvd.). Motion rapid, lasted 5 seconds. Direction E. Loud earth noises heard. Small objects shifted. Ground cracked. Ground: Compact.

Pedro Valley (852 Serra Dr.). V. Motion rapid. Direction SW. Loud earth noises heard. Small objects shifted. Ground: Compact, level.

Pedro Valley (852 Malaga Dr.). V. Motion rapid, lasted 1 minute. Direction NE. Moderate earth noises heard. Small objects shifted. Ground: Soil, compact, level.

Pedro Valley (1435 Serra Dr.). V. Motion rapid, lasted 30-45 seconds. Direction N-S. Moderate earth noises like a "whooshing" roar heard. Small objects shifted. Ground: Adobe soil, level.

Pedro Valley (Purity Store, Linda Mar). V. Motion rapid, lasted 15-20 seconds. Direction N-S. Moderate earth noises heard. Small objects and furnishings shifted. "In my home (1140 Rosita) it twisted and knocked pictures and bottles." Ground: Level.

Pedro Valley (1636 Rosita Rd.). V. Motion slow, lasted about 1½ minutes. Direction NE. Moderately loud earth noises heard. Small objects and furnishings shifted. Ground: Compact.

Pedro Valley (1364 Castro Court). V. Motion rapid, lasted 15 seconds. Moderate earth noises heard. Small objects and furnishings shifted. Ground: Soil, level, filled in.

Pedro Valley (904 Linda Mar Blvd.). V. Motion moderately rapid, lasted 30-40 seconds. Moderate earth noises heard. Small objects and furnishings shifted. Ground: Filled in, level.

Pescadero Elementary School. School showed no apparent structural damage. Minor plaster cracking and few exterior minor stucco cracks.

Pescadero. V. Motion rapid. Loud earth noises heard. Frightened all in community. Ground: Soil.

Pinole. Motion rapid. Moderate earth noises heard by many. Felt by all and frightened many in community. Windows, doors, and dishes rattled; house creaked. Hanging objects swung. Trees, bushes shaken moderately. Small objects shifted and overturned. Damage slight. Ground: Rocky, level.

Pittsburg. Motion slow, lasted 30 seconds. Direction E. Frightened many in community. Windows and doors rattled; walls creaked. Hanging objects swung NE. Plaster cracked. Damage slight. Ground: Soil, compact, level.

22 March, 11:44:21*. Intensity VI. (cont.)

Pittsburg (354 Andrew Ave.). Motion slow, lasted about 20 seconds. Moderate earth noises heard. Curtains and blinds swayed noticeably. Hairline cracks in outside stucco. Ground: Soil, compact, level.

Pittsburg (Camp Stoneman). IV. Motion rapid, lasted 10 seconds. Direction E-W. Felt by many (some outdoors; quiet); frightened few in office. Windows and office machines rattled; frame and floor creaked. Hanging objects swung. Ground: Soil, compact, level.

Pittsburg (American Trust Bldg.). III. Motion slow, lasted 3-5 seconds. Direction N. Ground: Level, marshy, filled in.

Point Reyes Station. Moderate earth noises heard. Felt by all; frightened few. House creaked. Hanging objects swung. Trees, bushes shaken moderately. Small objects shifted. Chimneys cracked. Damage slight. Ground: Compact, level.

Point Reyes Station. II. Motion rapid, lasted 10 seconds. Faint earth noises heard. Ground: Soil, level.

Port Chicago. Motion rapid, lasted about 45 seconds. Felt by many (some outdoors; active); frightened many in community. Windows, doors, and dishes rattled. Trees, bushes shaken strongly. Damage slight. Ground: Compact.

Port Costa. Motion rapid. Felt by and frightened all in community. Windows, doors, and dishes rattled; house creaked. Wall cracked. Ground: Rocky soil, compact.

Port Costa. Motion rapid, lasted 2 minutes. Felt by all in home and community; frightened few. Windows, doors, and dishes rattled; house creaked. Plaster, windows, and walls cracked slightly. Knickknacks, books, pictures, and plaster fell. "Had to dismiss school. Damage to school building. Many small aftershocks felt." Ground: Filled in.

Redwood City (at intersection of Woodside Road and Massachusetts Ave.). "Very definite ground waves as indicated by overhead electric wires and telephone cables. Those running parallel to Massachusetts Avenue alternately sagged very low then snapped taut. I saw this repeated twice; may have occurred again, but I failed to observe it. Utility lines on Woodside Road did not move with the sagging-stretching motion, but swayed from side to side. No foreshocks noticed; some subsequent ones noticed but time not recorded."

Redwood City (984 Glennan Dr.). Motion rapid, lasted at least 2 minutes. Loud earth noises heard. Small objects shifted. Cement garage floor cracked. Ground: Rocky, steep.

Redwood City (No. 3 Fire Station, 2nd and Bay Rd.). Motion slow, lasted about 7 seconds. Fire trucks in station (with hand brakes on) moved back and forth at least a foot. Ground: Soil, level.